CLAIMS

1. An electromagnetic radiation detector comprising a layer of a radiation sensitive material; an amplification device; and one or more signal collectors, the amplification device comprising a plurality of alternatively stacked layers of a dynode material and an electrical insulator, each dynode layer having exposed secondary electron emissive material and each stacked layer having a plurality of apertures which align with apertures in adjacent layers to form a plurality of electron multiplier channels extending through the stacked layers, and power supply connections to each dynode layer for applying a predetermined voltage potential to each dynode layer wherein the one or more signal collectors is positioned at the opposite end of the electron multiplier channels to the radiation sensitive material such that a signal from the radiation sensitive material of the detection of electromagnetic radiation is amplified in one or more of the electron amplifier channels before being collected by said one or more signal collectors.

2. A detector as claimed in claim 1, having a plurality of signal collectors with each signal collector being associated with one or more electron multiplier channels.

3. A detector as claimed in any one of the preceding claims, wherein the walls of the apertures in each dynode layer are tapered towards the one or more signal collectors.

4. A detector as claimed in any one of the preceding claims wherein the one or more signal collectors are one or more anodes mounted on a substrate located at the ends of the electron multiplier channels.

5. A detector as claimed in claim 4, comprising a plurality of

individually addressable anodes and wherein the detector further includes an image data link for communication with each of the anodes for receiving position specific image data from each of the anodes.

6. A detector as claimed in any one of claims 1 to 3, wherein the one or more signal collectors contain phosphor and emit light in response to incident electrons from the electron multiplier channels.

7. A detector as claimed in any one of claims 1 to 6, wherein the amplification device consists of a continuous monolithic array of electronic multiplier channels having an upper active surface extending at least 1 m^2.

8. A detector as claimed in claim 7, wherein the upper active surface of the amplification device is non-planar.

9. An x-ray imaging device comprising a layer of x-ray radiation sensitive material; an amplification device; and an image processor, the amplification device comprising a plurality of alternatively stacked layers of a dynode material and an electrical insulator, each dynode layer having exposed secondary electron emissive material and each stacked layer having a plurality of apertures which align with apertures in adjacent layers to form a plurality of electron multiplier channels extending through the stacked layers, power supply connections to each dynode layer for applying a predetermined voltage potential to each dynode layer and a plurality of anodes located at the ends of the electron multiplier channels, each anode being associated with one or more channels and having an image data link for supplying position sensitive image data to the image processor for generating a two dimensional image of x-ray radiation incident on said imaging device.

10. An x-ray imaging device as claimed in claim 9, having an image resolution of at least 50 pixels per mm.

11. An x-ray imaging device as claimed in any one of claims 9 or 10, wherein the amplification device consists of a continuous monolithic array of electronic multiplier channels having an upper active surface extending at least 1 m^2.

12. An x-ray imaging device as claimed in any one of claims 9 to 11, wherein the upper active surface of the amplification device is non-planar.

13. A patient bed incorporating an x-ray imaging device as claimed in any one of claims 9 to 12.

14. A patient bed as claimed in claim 13, wherein the x-ray imaging device is in a fixed position in the bed and extends substantially the entire effective length of the patient bed.

15. A patient bed as claimed in any one of claims 9 to 14, wherein the longitudinal sides of the bed extend upwardly from the bed surface and include a portion of the x-ray imaging device whereby three dimensional x-ray images of a patient on the bed can be generated.

16. A display comprising a layer of phosphor material; an amplification device; a plurality of field emission tips; and a driver device, the amplification device comprising a plurality of alternatively stacked layers of a dynode material and an electrical insulator, each dynode layer having exposed secondary electron emissive material and each stacked layer having a plurality of apertures which align with apertures in adjacent layers to form a plurality of electron multiplier channels extending through the stacked layers, power supply connections to each dynode layer for applying a predetermined voltage potential to each dynode layer wherein electrons emitted by the field emission tips under control of the driver

device are multiplied by the amplification device before being incident on the layer of phosphor material so as to generate a two dimensional image in the layer of phosphor material.

17. A display as claimed in claim 16, having a minimum tile size of 1 m^2.

18. A display as claimed in claims 16 or 17, wherein the layer of phosphor material includes a plurality of strips of different colour phosphor material each phosphor strip being aligned with one or more electron multiplier channels.

19. A head mounted display including a display as claimed in claim 16.

20. A head mounted display as claimed in claim 19 further including through holes extending through the amplification device permitting the passage of light.